Docket Nos. 50-327
and 50-328

April 27, 1990

Mr. Oliver D. Kingsley, Jr.
Senior Vice President, Nuclear Power
Tennessee Valley Authority
6N 38A Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

Dear Mr. Kingsley:

SUBJECT: QUADRANT POWER TILT RATIO (TAC 75051/75052) (TS 89-36) - SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2

The Commission has issued the enclosed Amendment No. 135 to Facility Operating License No. DPR-77 and Amendment No. 122 to Facility Operating License No. DPR-79 for the Sequoyah Nuclear Plant, Units 1 and 2, respectively. These amendments are in response to your application dated October 5, 1989 and the supplemental letter dated April 9, 1990 to your application.

The amendments modify Section 3/4.2.4, Quadrant Power Tilt Ratio, and Table 3.3-1, Reactor Trip System Instrumentation, of the Sequoyah Nuclear Plant, Units 1 and 2, Technical Specifications (TSs). The changes revise the action statements in Table 3.3-1, for monitoring the quadrant power tilt ratio when power range instrumentation is inoperable, to provide a consistent set of actions to be taken when the quadrant power tilt ratio is not monitored or confirmed in accordance with either Surveillance Requirement (SR) 4.2.4.1 or 4.2.4.2. This adds two action statements to TS 3/4.2.4. There is also a change to SR 4.2.4.2 to allow a full core map using the incore detector system, instead of only the currently required four pairs of symmetric thimble locations, to confirm the normalized symmetric power distribution in the core.

A copy of the Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's Bi-Weekly Federal Register Notice.

Sincerely,
Original signed by

Suzanne Black, Assistant Director
for Projects
TVA Projects Division
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 135 to License No. DPR-77
2. Amendment No. 122 to License No. DPR-79
3. Safety Evaluation

cc w/enclosures:
See next page

OFC	:NRR:TVA/PM	:OGC	:TVA:AD/P	:	:	:	:
NAME	:JDonohew:as	:RBachmann	:SBlack	:	:	:	:
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AMENDMENT NO. 135 FOR SEQUOYAH UNIT NO. 1 - DOCKET NO. 50-327 and
AMENDMENT NO. 122 FOR SEQUOYAH UNIT NO. 2 - DOCKET NO. 50-328
DATED: April 27, 1990

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-327

SEQUOYAH NUCLEAR PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 135
License No. DPR-77

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Tennessee Valley Authority (the licensee) dated October 5, 1989 and the supplemental letter dated April 9, 1990, comply with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-77 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 135 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Suzanne Black

Suzanne Black, Assistant Director
for Projects
TVA Projects Division
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: April 27, 1990

ATTACHMENT TO LICENSE AMENDMENT NO. 135

FACILITY OPERATING LICENSE NO. DPR-77

DOCKET NO. 50-327

Revise the Appendix A Technical Specifications by removing the pages identified below and inserting the enclosed pages. The revised pages are identified by the captioned amendment number and contain marginal lines indicating the area of change. Overleaf pages* are provided to maintain document completeness.

REMOVE	INSERT
3/4 2-17	3/4 2-17
3/4 2-18	3/4 2-18*
3/4 3-5	3/4 3-5

ACTION: (Continued)

2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 2 hours and reduce the Power Range Neutron Flux-High Trip Setpoints to less than or equal to 55% of RATED THERMAL POWER within the next 4 hours.

3. Identify and correct the cause of the out of limit condition prior to increasing THERMAL POWER; subsequent POWER OPERATION above 50% of RATED THERMAL POWER may proceed provided that the QUADRANT POWER TILT RATIO is verified within its limit at least once per hour for 12 hours or until verified at 95% or greater RATED THERMAL POWER.

d. With the indicated QUADRANT POWER TILT RATIO not confirmed as required by Surveillance Requirement 4.2.4.2, reduce THERMAL POWER to less than 75 percent RATED THERMAL POWER within 6 hours.

e. With the QUADRANT POWER TILT RATIO not monitored as required by Surveillance Requirement 4.2.4.1, reduce THERMAL POWER to less than 50 percent of RATED THERMAL POWER within the next 6 hours.

f. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.2.4.1 The QUADRANT POWER TILT RATIO shall be determined to be within the limit above 50% of RATED THERMAL POWER by:

a. Calculating the ratio at least once per 7 days when the alarm is OPERABLE.

b. Calculating the ratio at least once per 12 hours during steady state operation when the alarm is inoperable.

4.2.4.2 The QUADRANT POWER TILT RATIO shall be determined to be within the limit when above 75 percent of RATED THERMAL POWER with one Power Range Channel inoperable by using the movable incore detectors to confirm that the normalized symmetric power distribution, obtained from the 4 pairs of symmetric thimble locations or from performance of a full core map, is consistent with the indicated QUADRANT POWER TILT RATIO at least once per 12 hours.

3/4.2.5 DNB PARAMETERS

LIMITING CONDITION FOR OPERATION

3.2.5 The following DNB related parameters shall be maintained within the limits shown on Table 3.2-1:

a. Reactor Coolant System T_{avg}.

b. Pressurizer Pressure

APPLICABILITY: MODE 1

ACTION:

With any of the above parameters exceeding its limit, restore the parameter to within its limit within 2 hours or reduce THERMAL POWER to less than 5% of RATED THERMAL POWER within the next 4 hours.

SURVEILLANCE REQUIREMENTS

4.2.5 Each of the parameters of Table 3.2-1 shall be verified to be within their limits at least once per 12 hours.

TABLE 3.3-1 (Continued)

TABLE NOTATION

* With the reactor trip system breakers in the closed position and the control rod drive system capable of rod withdrawal, and fuel in the reactor vessel.

** The channel(s) associated with the protective functions derived from the out of service Reactor Coolant Loop shall be placed in the tripped condition.

The provisions of Specification 3.0.4 are not applicable.

High voltage to detector may be de-energized above the P-6 (Block of Source Range Reactor Trip) setpoint.

ACTION STATEMENTS

ACTION 1 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in HOT STANDBY within the next 6 hours and/or open the reactor trip breakers.

ACTION 2 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 6 hours.

b. The Minimum Channels OPERABLE requirement is met; however, one additional channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.1.1.1.

c. The QUADRANT POWER TILT RATIO is monitored in accordance with Technical Specification 3.2.4.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-328

SEQUOYAH NUCLEAR PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 122
License No. DPR-79

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Tennessee Valley Authority (the licensee) dated October 5, 1989 and the supplemental letter dated April 9, 1990, comply with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-79 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 122 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Suzanne Black

Suzanne Black, Assistant Director
for Projects
TVA Projects Division
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: April 27, 1990

ATTACHMENT TO LICENSE AMENDMENT NO. 122

FACILITY OPERATING LICENSE NO. DPR-79

DOCKET NO. 50-328

Revise the Appendix A Technical Specifications by removing the pages identified below and inserting the enclosed pages. The revised pages are identified by the captioned amendment number and contain marginal lines indicating the area of change. Overleaf pages* are provided to maintain document completeness.

REMOVE	INSERT
3/4 2-15	3/4 2-15
3/4 2-16	3/4 2-16*
3/4 3-5	3/4 3-5

ACTION: (Continued)

2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 2 hours and reduce the Power Range Neutron Flux-High Trip Setpoints to less than or equal to 55% of RATED THERMAL POWER within the next 4 hours.

3. Identify and correct the cause of the out of limit condition prior to increasing THERMAL POWER; subsequent POWER OPERATION above 50% of RATED THERMAL POWER may proceed provided that the QUADRANT POWER TILT RATIO is verified within its limit at least once per hour for 12 hours or until verified at 95% or greater RATED THERMAL POWER.

d. With the indicated QUADRANT POWER TILT RATIO not confirmed as required by Surveillance Requirement 4.2.4.2, reduce THERMAL POWER to less than 75 percent RATED THERMAL POWER within 6 hours.

e. With the QUADRANT POWER TILT RATIO not monitored as required by Surveillance Requirement 4.2.4.1, reduce THERMAL POWER to less than 50 percent of RATED THERMAL POWER within the next 6 hours.

f. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.2.4.1 The QUADRANT POWER TILT RATIO shall be determined to be within the limit above 50% of RATED THERMAL POWER by:

a. Calculating the ratio at least once per 7 days when the alarm is OPERABLE.

b. Calculating the ratio at least once per 12 hours during steady state operation when the alarm is inoperable.

4.2.4.2 The QUADRANT POWER TILT RATIO shall be determined to be within the limit when above 75 percent of RATED THERMAL POWER with one Power Range channel inoperable by using the movable incore detectors to confirm that the normalized symmetric power distribution, obtained from 4 pairs of symmetric thimble locations or from performance of a full core map, is consistent with the indicated QUADRANT POWER TILT RATIO at least once per 12 hours.

POWER DISTRIBUTION LIMITS

3/4 2.5 DNB PARAMETERS

LIMITING CONDITION FOR OPERATION

3.2.5 The following DNB related parameters shall be maintained within the limits shown on Table 3.2-1:

a. Reactor Coolant System T_{avg}.

b. Pressurizer Pressure.

APPLICABILITY: MODE 1.

ACTION:

With any of the above parameters exceeding its limit, restore the parameter to within its limit within 2 hours or reduce THERMAL POWER to less than 5% of RATED THERMAL POWER within the next 4 hours.

SURVEILLANCE REQUIREMENTS

4.2.5 Each of the parameters of Table 3.2-1 shall be verified to be within their limits at least once per 12 hours.

TABLE 3.3-1 (Continued)

TABLE NOTATION

* With the reactor trip system breakers in the closed position, the control rod drive system capable of rod withdrawal, and fuel in the reactor vessel.

** The channel(s) associated with the protective functions derived from the out of service Reactor Coolant Loop shall be placed in the tripped condition.

The provisions of Specification 3.0.4 are not applicable.

High voltage to detector may be de-energized above the P-6 (Block of Source Range Reactor Trip) setpoint.

ACTION STATEMENTS

ACTION 1 - With the number of OPERABLE channels one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in HOT STANDBY within the next 6 hours and/or open the reactor trip breakers.

ACTION 2 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 6 hours.

b. The Minimum Channels OPERABLE requirement is met; however, one additional channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.1.1.1.

c. The QUADRANT POWER TILT RATIO is monitored in accordance with Technical Specification 3.2.4.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

ENCLOSURE 3

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 135 TO FACILITY OPERATING LICENSE NO. DPR-77

AND AMENDMENT NO. 122 TO FACILITY OPERATING LICENSE NO. DPR-79

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NOS. 50-327 AND 50-328

1.0 INTRODUCTION

By letter dated October 5, 1989 (Ref. 1), the Tennessee Valley Authority (TVA) proposed changes to the Technical Specifications (TSs) for the Sequoyah Nuclear Plant (SQN), Units 1 and 2. The proposed changes would clarify the actions to be taken when it is not possible to monitor or confirm the quadrant power tilt ratio when a power range instrument is inoperable. These changes revise Action Statement "2" of Table 3.3-1 of TS 3.3.1.1 and add two action statements to TS 3/4.2.4. In addition, TVA proposed to change Surveillance Requirement (SR) 4.2.4.2 to allow the use of a full core map to confirm the core power distribution. This change would prevent an unnecessary plant derate in the event that one of the instrument thimbles, which is needed to monitor the quadrant power tilt ratio, becomes inoperable.

These proposed changes remove a perceived ambiguity in the interpretation of these TSs. Upon failure of a power range detector, TVA entered Action Statement "2.d" of TS 3.3.1.1 which requires that the quadrant power tilt ratio, as indicated by the remaining three power range detectors, be verified consistent with the normalized symmetric power distribution obtained by using the movable incore detectors in the four pairs of symmetric thimble locations at least once every 12 hours when thermal power is greater than 75 percent of rated thermal power. With 25 minutes remaining in the action statement time limit, TVA had not successfully completed a flux map. TVA then made a decision to invoke the provisions of TS 3.0.3, which is applicable when action statements can not be met. The appropriate flux measurements were completed within the subsequent time allowance of TS 3.0.3, approximately 17 hours after the failure of the power range detector. Another interpretation of these TSs is that TVA should have reduced power to less than or equal to 75 percent of rated thermal power, when Action Statement "2.d" of TS 3.3.1.1 could not be met. This is discussed in License Event Report 89-022 for Unit 1, dated August 21, 1989 and in the staff's letters to TVA dated August 28 and December 4, 1989.

In its submittal dated April 9, 1990, TVA stated that after discussions with the staff it agreed to revise the proposed Action Statement "e" for TS 3/4.2.4 to require the power level to be reduced to less than 50% of rated thermal power if SR 4.2.4.1 can not be met. This revision is conservative and does not change the substance of the proposed action in the Federal Register Notice (54 FR 46158) published on November 1, 1989 for the proposed amendments and does not affect the staff's initial determination of no significant hazards consideration in that notice.

2.0 EVALUATION

TVA identified the possibility of multiple interpretations for the actions to be taken when the quadrant power tilt ratio is not monitored or confirmed in accordance with SRs 4.2.4.1 and 4.2.4.2. TVA concluded that TS 3/4.2.4 does not specify actions to be taken when either SR 4.2.4.1 or 4.2.4.2 cannot be performed in the specified time interval. Possible interpretations can lead to the application of TS 3.0.3 or the most limiting action in TS 3/4.2.4, with the final power level not clearly specified. Possible interpretations on the final power level can include power levels below which TS 3/4.2.4 is not applicable or power levels below which the specific SR is not applicable. TVA, therefore, has proposed two new action statements for TS 3/4.2.4 to specifically address situations when SRs 4.2.4.1 and 4.2.4.2 cannot be performed in the specified time interval. The action statements apply any time the SRs cannot be performed, regardless of cause.

TVA also evaluated Action Statement "2" of TS 3.3.1.1 for multiple interpretations. It stated that Action Statement "2.d" is apparently redundant to SR 4.2.4.2. Action Statement "2.c" has two options that can be performed, one of which appears to apply different requirements than Action statement "2.d" when reactor power is below 75 percent of rated thermal power. One interpretation is that Action Statement "2.c" requires a power reduction and a recalibration within four hours when Action Statement "2.d" cannot be met. Another interpretation is that TS 3.0.3 applies when Action Statement "2.d" cannot be met because none of the conditions in Action Statement "2" specifically address the situation. TVA also points out an ambiguity between similar actions in TS 3/4.2.4 and Action Statement "2.c" of TS 3.3.1.1.

TVA, therefore, proposed (1) revisions to Action Statement "2.c" of TS 3.3.1.1 to eliminate requirements that are redundant to SRs 4.2.4.1 and 4.2.4.2 and (2) the addition of two new action statements for TS 3/4.2.4. These changes should remove the ambiguities in the interpretation of the required actions to be taken when, for example, a power range detector is not operable.

The proposed changes are evaluated as follows:

Proposed Specification 3.2.4, Action Statement "d"

This proposed action statement requires a power reduction to less than 75 percent of rated thermal power within 6 hours if the quadrant power tilt ratio is not confirmed as required by SR 4.2.4.2. This SR is applicable when

one power range detector is inoperable and the reactor power is above 75 percent of rated thermal power. TVA has chosen a time interval of six hours to complete the requirements of the action statement because Action Statement "d" applies only to cases where monitoring capability is affected. Although, the time interval for action is four hours in the existing Action Statement "2.c" of Table 3.3-1, the difference between the proposed six hours and the existing four hours is not considered significant. The proposed six hours is used in other action statements in the TSs for the time interval to reduce power. Based on our review, we conclude that new Action Statement "d" of TS 3.2.4 is acceptable because it is consistent with current NRC requirements on monitoring the quadrant power tilt ratio and because it eliminates ambiguity in the current TSs.

Proposed Specification 3.2.4 Action Statement "e"

This revised proposed action statement requires a power reduction to less than 50 percent of rated thermal power within 6 hours if the quadrant power tilt ratio is not monitored, as required by SR 4.2.4.1. SR 4.2.4.1 is applicable at all times when the reactor power is above 50 percent of rated thermal power and has provisions for when the alarm on quadrant power tilt is either operable or inoperable. TVA has chosen time intervals for this action statement that it deems appropriate because only monitoring capability is affected. Based on our review, we conclude that the new Action Statement "e" of TS 3.2.4 is acceptable because it is consistent with current NRC requirements on monitoring the quadrant power tilt ratio and because it eliminates ambiguity in the current TSs.

Revised Surveillance Requirement 4.2.4.2

TVA proposed a change to SR 4.2.4.2 to allow the use of the movable incore detectors to obtain a full core flux map in addition to the four pairs of symmetric thimble locations currently used to monitor the quadrant power tilt ratio. The longer time interval that would be required to take a full core flux map is well within the time interval required to complete SR 4.2.4.2. Therefore, this change to SR 4.2.4.2 is acceptable because a full core flux map is just as capable as the four pairs of symmetric locations for providing information on the quadrant power tilt ratio.

Revised Table 3.3-1, Action Statements "2.c" And "2.d"

TVA has evaluated Action Statements "2.c" and "2.d" of Table 3.3-1 in TS 3.3.1.1. TVA concluded that Action Statement "2.d" is redundant to SR 4.2.4.2 in that both apply to monitoring the quadrant power tilt ratio when a power range detector is inoperable. TVA also concluded that Action Statement "2.c," which has two options, appears to apply different requirements than Action Statement "2.d" when reactor power is below 75 percent of rated thermal power. TVA proposed to eliminate Action Statement "2.d" and to rewrite Action Statement "2.c" to refer to TS 3/4.2.4 for requirements on monitoring the quadrant power tilt ratio. Based on our review, we conclude that the proposed changes to Action Statements "2.c" and "2.d" of TS 3.3.1.1 are acceptable because monitoring of the quadrant power tilt ratio will be performed in

accordance with the provisions of TS 3/4.2.4 and because the changes eliminate ambiguity in the current TSs.

3.0 CONCLUSIONS

TVA has requested changes to the TSs that will clarify the requirements on monitoring the quadrant power tilt ratio of the core whenever a power range detector is inoperable. Our review has concluded that these proposed changes in the letters dated October 5, 1989 and April 6, 1990 are acceptable because present NRC requirements on monitoring the quadrant power tilt ratio are maintained by the proposed changes and the proposed changes reduce ambiguity in the TSs.

4.0 ENVIRONMENTAL CONSIDERATION

These amendments involve a change to a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes to the surveillance requirements. The staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that these amendments involve no significant hazards consideration and there has been no public comment on such finding. Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement nor environmental assessment need be prepared in connection with the issuance of these amendments.

5.0 CONCLUSION

The Commission made a proposed determination that the amendment involves no significant hazards consideration which was published in the Federal Register (54 FR 46158) on November 1, 1989 and consulted with the State of Tennessee. No public comments were received and the State of Tennessee did not have any comments.

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendments will not be inimical to the common defense and security nor to the health and safety of the public.

6.0 REFERENCES

1. Letter from M. J. Ray (TVA) to NRC, Subject: Technical Specification (TS) Change 89-36, dated October 5, 1989.

2. Letter from M. J. Ray (TVA) to NRC, Subject: Technical Specification (TS) Change 89-36 - Additional Information, dated April 9, 1990.

Principal Contributor: D. Fieno

Dated: April 27, 1990